



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/797,513	03/10/2004	Brian S. Higgins	1340-012	4226
4678	7590	03/30/2006	EXAMINER	
MACCORD MASON PLLC 300 N. GREENE STREET, SUITE 1600 P. O. BOX 2974 GREENSBORO, NC 27402			COCKS, JOSIAH C	
			ART UNIT	PAPER NUMBER
			3749	

DATE MAILED: 03/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/797,513

Applicant(s)

HIGGINS, BRIAN S.

Examiner

Josiah Cocks

Art Unit

3749

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 January 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Receipt of applicant's amendment filed 1/23/2006 is acknowledged.

Drawings & Specification

2. The drawings and amendments to the specification filed on 1/23/2006 are accepted by the examiner.

Terminal Disclaimer

3. The terminal disclaimer filed on 1/23/2006 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of any patent issuing from U.S. Patent Application 10/797,272 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-32 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 4,824,441 to Kindig ("Kindig").

Kindig discloses a method in the same field of endeavor as applicant's invention and as described in applicant's claims 1-32. In particular, Kindig describes a method of reducing the acidity of flue gas (e.g. NO_x and SO₃, see abstract) and lowering the temperature of the flue gas (see at least abstract and col. 6, lines 14-19, and col. 14, lines 45-54); partially combusting the fuel in a first state to create a reducing environment (see at least col. 6, lines 4-14 and col. 10, lines 51-54); maintaining the reducing environment for a sufficient time period such that reducible acids are reduced to achieve a desirable acidity concentration in the flue gas (see at least col. 12, line 54 through col. 13, line 23, note particularly equation 7); combusting the remainder of the fuel and combustion intermediates in a second stage with oxidizing environment in order to decrease the acidity of the flue gas by reducing the acid concentration of the gas (see at least col. 10, lines 43-49).

Kindig also discloses micro-staging the first stage fuel combustion where the micro-staging is provided through the use of low NO_x burners (see at least col. 12, lines 40-44), macro-staging the first stage of fuel combustion where the macro-staging is provided through the use of over-fired air (see col. 10, lines 43-46), combinations of the two staging techniques, and the fuel is coal (see col. 1, line 16).

Response to Arguments

6. Applicant's arguments filed 1/23/2006 have been fully considered but they are not persuasive.

Applicant argues that Kindig does not teach maintaining the reducing environment for a sufficient time period such that reducible acids are reduced. The examiner does not agree.

Art Unit: 3749

As noted above, Kindig clearly suggests that reducible acids (e.g. sulfur oxides and nitrogen oxides) are reduced when a fuel is introduced with a sulfur sorbent in an oxygen restricted combustion zone and combusted (see at least col. 6, lines 4-12). This initial combustion process results in combustion temperature of between about 2300 and 2700 degrees Fahrenheit (see col. 6, lines 12-14). Of the sequence of reactions identified in col. 12, lines 60-64 (which show the use of dolomite as the sulfur sorbent) reaction (5) occurs first in the highest temperature ranges. The result of this reaction is that the calcium present begins to sulfate (see col. 12, line 68 through col. 13, line 1). This sulfation reaction occurs in a reducing environment and is considered to last “for a sufficient time period such that reducible acids are reduced to achieve a desirably acidity concentration in the flue gas” as recited in applicant’s claims.

Kindig further notes that the next reactions in the sequence (i.e. reactions 6 and 7) occur at lower temperatures (see col. 13, lines 1-22). These lower temperatures are attained by the calcinations reactions of the sulfur sorbents (see col. 11, lines 5-9 and col. 12, lines 44-45). Further, Kindig expressly provides that combustion temperatures may be controlled by adjusting the amount of oxygen fed at secondary and tertiary locations (see col. 10, lines 43-45). These intermediate stages of combustion therefore occur in an oxidizing environment and represent the oxidizing environment recited in applicant’s step (c) of claim 1.

Applicant also argues that Kindig does not show applicant’s method of lowering the acid dewpoint temperature of the flue gas. However, as noted above, Kindig is clearly concerned with lowering the temperature of the flue gas (see at least col. 6, lines 14-19, and col. 14, lines 45-54), which is regarded to meet applicant’s claim limitations.

Art Unit: 3749

Accordingly, applicant's claims are not considered to patentably define over the prior art of record.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

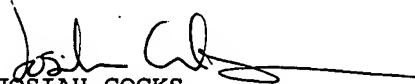
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Josiah Cocks whose telephone number is (571) 272-4874. The examiner can normally be reached on weekdays from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ehud Gartenberg, can be reached at (571) 272-4828. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Art Unit: 3749

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

jcc
March 22, 2006


JOSIAH COCKS
PRIMARY EXAMINER
ART UNIT 3749